Criterion 1 – Curricular Aspects

Key Indicator	1.2	**Academic Flexibility**
Metric	1.2.2	Percentage of Programmes in which Choice Based Credit System (CBCS)/elective course system has been implemented (Data for the latest completed academic year)

DEPARTMENT OF CIVIL ENGINEERING

STRUCTURE OF THE PROGRAM CLEARLY INDICATING COURSES, CREDITS/ELECTIVES

PROGRAMMES
1. **B.Tech- Civil Engineering (Full Time)**
2. **B.Tech- Civil Engineering (Full Time)**
3. **Master of Technology in Environmental Engineering (Full Time)**

1. A. B.Tech- Civil Engineering (Full Time)

REGULATIONS – 2021

S.No	Category	Course Code	Courses	Credits			
				L	T	P	TO
SEMESTER I							
1.	MA-I	XMA101	Calculus and Linear Algebra	3	1	0	4
2.	BE	XBE102	Electrical and Electronic Engineering Systems	3	1	0	4
3.	P	XAP103	Physics	3	1	0	4
4.	EG	XEG104	Engineering Graphics and Design	1	0	2	3
5.	SC	XGS105	Speech Communication	0	0	3	3
6.	UMAN-I	XUM106	Constitution of India	0	0	0	0
7.	BE-L	XBE107	Electrical and Electronic Engineering Systems Laboratory	0	0	1	1
8.	PL	XAP108	Applied Physicsfor Engineers Laboratory	0	0	1	1
			Total	**10**	**3**	**7**	**20**
SEMESTER II							
1.	MA-II	XMA201	Calculus, Ordinary Differential Equations and Complex Variable	3	1	0	4
2.	PPS-T	XCP202	Programming for Problem Solving	3	0	0	3
3.	C	XAC203	Chemistry	3	1	0	4
4.	TC	XGS204	Technical Communication	2	0	0	2
5.	Works	XWP205	Workshop Practices	1	0	2	3
6.	EM	XEM206	Engineering Mechanics	3	0	0	3
7.	PPS-L	XCP207	Programming for Problem Solving Laboratory	0	0	1	1
8.	CL	XAC208	Chemistry Laboratory	0	0	1	1
			Total	**15**	**2**	**4**	**21**

S.No	Category	Course Code	Courses	Credits			
				L	T	P	TO
SEMESTER III							
1.	MA-III	XMA301	Transforms and Partial Differential Equations	3	0	0	3
2.	PCC T	XCE302	Mechanics of Solids-I	2	1	0	3
3.	PCC-T	XCE303	Fluid Mechanics and Machinery	2	1	0	3
4.	PCC-T	XCE304	Building Materials and Construction	3	0	0	3
5.	PCC-T	XCE305	Surveying – I	2	1	0	3
6.	MNGT-I	XUM306	Entrepreneurship Development	2	0	0	2
7.	UMAN-II	XUM307	Universal Human Values 2: Understanding Harmony and Gender	2	1	0	3
8.	PCC-L	XCE308	Strength of Materials Laboratory	0	0	1	1
9.	PCC-L	XCE309	Fluid Mechanics and Machinery Laboratory	0	0	1	1
10.	IPT-I	XCE310	In-plant Training-I	0	0	0	1
			Total	**16**	**4**	**2**	**23**
SEMESTER IV							
1.	MA-IV	XMA401	Probability and Statistics	3	0	0	3
2.	PCC T	XCE402	Mechanics of Solids-II	2	1	0	3
3.	PCC-T	XCE403	Surveying – II	2	1	0	3
4.	PCC-T	XCE404	Geotechnical Engineering - I	2	1	0	3
5.	PCC-T	XCE405	Concrete Technology	3	0	0	3
6.	MNGT-II	X**406	Economics for Engineers	3	0	0	3
7.	UMAN-III	X**407	Disaster Management	0	0	0	0
8.	PCC-L	XCE408	Computer Aided Civil Engineering Drawing	0	0	1	1
9.	PCC-L	XCE409	Surveying Laboratory	0	0	1	1
10.	PCC-L	XCE410	Geotechnical Engineering Laboratory	0	0	1	1
			Total	**15**	**3**	**3**	**21**

S.No	Category	Course Code	Courses	L	T	P	TO
					Credits		
SEMESTER V							
1.	PCC T	XCE501	Structural Analysis	2	1	0	3
2.	PCC-T	XCE502	Transportation Engineering	3	0	0	3
3.	PCC-T	XCE503	Environmental Engineering	3	0	0	3
4.	PCC-T	XCE504	Geotechnical Engineering - II	2	1	0	3
5.	PEC-I	XCEE**	Professional Elective -I	3	0	0	3
6.	OE I	XOE**	Open Elective Courses-I	3	0	0	3
7.	PCC-L	XCE507	Environmental Engineering Laboratory	0	0	1	1
8.	PCC-L	XCE508	Concrete & Highway Laboratory	0	0	1	1
9.	IPT-II	XCE509	In-plant Training – II	0	0	0	1
			Total	**16**	**2**	**2**	**21**
SEMESTER VI							
1.	PCC -T	XCE601	Design of RCC Structures	3	1	0	4
2.	PCC- T	XCE602	Design of Steel Structures	2	1	0	3
3.	PCC-T	XCE603	Construction Engineering and Management	3	0	0	3
4.	PEC-II	XCEE**	Professional Elective -II	3	0	0	3
5.	OE II	XOE**	Open Elective Courses-II	3	0	0	3
6.	ELS	X**606	English Language Skills	1	0	2	3
7.	UMAN-IV	X**607	Cyber Security	0	0	0	0
8.	PCC-L	XCE608	Construction Management Laboratory	0	0	1	1
9.	PCC-L	XCE609	Survey Camp	0	0	1	1
			Total	**15**	**2**	**4**	**21**

S.No	Category	Course Code	Courses	Credits			
				L	T	P	TO
SEMESTER VII							
1.	PCC-T	XCE701	Finite Element Method	3	0	0	3
2.	PEC-III	XCEE**	Professional Elective III	3	0	0	3
3.	OE III	OE	Open Elective Courses-III	3	0	0	3
4.	UMAN-V	MC	Environmental studies	0	0	0	0
5.	PCC-L	XCE705	Computer Aided Design & Drafting	0	0	1	1
6.	PCC-L	XCE706	Estimation, Costing and Valuation	0	0	2	2
7.	Proj I	XCE707	Project Work (Phase-I)	0	0	3	3
8.	IPT III	XCE708	In-plant Training – III	0	0	0	3
			Total	**9**	**0**	**6**	**18**
SEMESTER VIII							
1.	PEC-IV	XCEE**	Professional Elective -IV	3	0	0	3
2.	OE IV	OE	Open Elective Courses-IV	3	0	0	3
3.	OE V	OE	Open Elective Courses-V	3	0	0	3
4.	PROJ II	XCE804	Project Work (Phase-II)	0	0	9	9
			Total	**9**	**0**	**9**	**18**

Total Credit - 163

Note

L – Lecture, T – Tutorial, P – Practical, C – Credit

PROFESSIONAL ELECTIVE COURSE - CIVIL ENGINEERING

[PEC-CE]

S.No	Category	Course Code	Courses	Credits			
				L	T	P	TO
Professional Elective Course I							
1.	PEC	XCEE01	Smart Structures and Materials	3	0	0	3
2.	PEC	XCEE02	GIS for Civil Engineering	3	0	0	3
3.	PEC	XCEE03	Water Quality Engineering	3	0	0	3
4.	PEC	XCEE04	Pavement Design	3	0	0	3
5.	PEC	XCEE05	Construction Equipment and Automation	3	0	0	3
6	PEC	XCEE06	Airport Planning and Design	3	0	0	3
7	PEC	XCEE07	Port and Harbour Engineering	3	0	0	3
.Professional Elective Course II							
1.	PEC	XCEE08	Earthquake Engineering	3	0	0	3
2.	PEC	XCEE09	Bridge Engineering	3	0	0	3
3.	PEC	XCEE10	Advanced Structural Analysis	3	0	0	3
4.	PEC	XCEE11	Basics of Computational Hydraulics	3	0	0	3
5.	PEC	XCEE12	Water Resources Engineering	3	0	0	3
6	PEC	XCEE13	Environmental Geotechnology	3	0	0	3
7	PEC	XCEE14	Geotechnical Design	3	0	0	3
Professional Elective Course III							
1.	PEC	XCEE15	Environmental Fluid Mechanics	3	0	0	3
2.	PEC	XCEE16	Environmental Impact Assessment	3	0	0	3
3.	PEC	XCEE17	Design of Hydraulic Structures	3	0	0	3
4.	PEC	XCEE18	Surface Hydrology	3	0	0	3
5.	PEC	XCEE19	Repairs and Rehabilitation of Structures	3	0	0	3
6	PEC	XCEE20	Urban Hydrology and Hydraulics	3	0	0	3
7	PEC	XCEE21	Building Construction Practice	3	0	0	3

S.No	Category	Course Code	Courses	Credits			
				L	T	P	TO
Professional Elective Course IV							
1.	PEC	XCEE22	Tall Structures				
2.	PEC	XCEE23	Environmental Law and Policy	3	0	0	3
3.	PEC	XCEE24	Groundwater Engineering	3	0	0	3
4.	PEC	XCEE25	Solid and Hazardous Waste Management	3	0	0	3
5.	PEC	XCEE26	Pre-stressed and Prefabricated Structures	3	0	0	3
6	PEC	XCEE27	Contracts Management	3	0	0	3
7	PEC	XCEE28	Air and Noise Pollution and Control	3	0	0	3
Open Elective Courses							
1.	OEC	XCEOE1	Remote Sensing & GIS	3	0	0	3
2.	OEC	XCEOE2	Building Services	3	0	0	3
3.	OEC	XCEOE3	Non Destructive Testing	3	0	0	3
4.	OEC	XCEOE4	Metro Systems and Engineering	3	0	0	3

1. B. Bachelor of Technology in Civil Engineering (Part Time)

REGULATION – 2021

S.No	Category	Course Code	Courses	Credits			
				L	T	P	TO
SEMESTER I							
1.	MA-I	PCE101	Probability and statistics	3	0	0	3
2.	PCC T	PCE102	Mechanics of Solids-I	2	1	0	3
3.	PCC-T	PCE103	Fluid Mechanics and Machinery	2	1	0	3
4.	PCC-L	PCE104	Strength of Materials Lab	0	0	2	2
5.	PCC-L	PCE105	Fluid Mechanics and Machinery Lab	0	0	2	2
			Total	**7**	**2**	**4**	**13**
SEMESTER II							
1.	PCC T	PCE201	Mechanics of Solids-II	2	1	0	3
2.	PCC-T	PCE202	Geotechnical Engineering - I	2	1	0	3
3.	PCC-T	PCE203	Concrete Technology	3	0	0	3
4.	UMAN-I	P**204	Disaster Management	0	0	0	0
5.	PCC-L	PCE205	Geotechnical Engineering Lab	0	0	2	2
			Total	**7**	**2**	**2**	**11**
SEMESTER III							
1.	PCC T	PCE301	Structural Analysis	3	1	0	4
2.	PCC-T	PCE302	Transportation Engineering	3	0	0	3
3.	PCC-T	PCE303	Environmental Engineering	3	0	0	3
4.	PCC-L	PCE304	Environmental Engineering Lab	0	0	2	2
5.	PCC-L	PCE305	Concrete & Highway Lab	0	0	2	2
			Total	**9**	**1**	**4**	**14**
SEMESTER IV							
1.	PCC -T	PCE401	Design of RCC Structures	3	1	0	4
2.	PCC-T	PCE402	Geotechnical Engineering - II	2	1	0	3
3.	PCC-T	PCE403	Construction Engineering and Management	3	0	0	3
4.	PEC-I	PCEE**	Professional Elective -I	3	0	0	3
5.	PCC-L	PCE405	Construction Management Lab	0	0	2	2
			Total	**11**	**2**	**2**	**15**

S.No	Category	Course Code	Courses	Credits			
				L	T	P	TO
SEMESTER V							
1.	PCC- T	PCE501	Design of Steel Structures	3	1	0	4
2.	PEC-II	PCEE**	Professional Elective II	3	0	0	3
3.	UMAN-V	MC	Environmental studies	0	0	0	0
4.	PCC-L	PCE504	Computer Aided Design & Drafting	0	0	2	2
5.	PCC-L	PCE505	Estimation, Costing and valuation	0	0	2	2
			Total	**6**	**1**	**4**	**11**
SEMESTER VI							
1.	PCC-T	PCE601	Finite Element Method	3	0	0	4
2.	PEC-III	PCEE**	Professional Elective –III	3	0	0	3
3.	PROJ II	PCE603	Project Work (Phase-I)	0	0	3	3
			Total	**6**	**0**	**3**	**10**
SEMESTER VII							
1.	PEC-IV	PCEE**	Professional Elective –IV	3	0	0	3
2.	PROJ II	PCE702	Project Work (Phase-II)	0	0	9	9
			Total	**3**	**0**	**9**	**12**

Total Credit - 86

Note
L – Lecture, T – Tutorial, P – Practical, C – Credit

PROFESSIONAL ELECTIVE COURSE - CIVIL ENGINEERING

[PEC-CE]

S.No	Category	Course Code	Courses	Credits			
				L	T	P	TO
Professional Elective Course I							
1.	PEC	PCEE01	Smart Structures and Materials	3	0	0	3
2.	PEC	PCEE02	GIS for Civil Engineering	3	0	0	3
3.	PEC	PCEE03	Water Quality Engineering	3	0	0	3
4.	PEC	PCEE04	Pavement Design	3	0	0	3
5.	PEC	PCEE05	Construction Equipment and Automation	3	0	0	3
6	PEC	PCEE06	Airport Planning and Design	3	0	0	3
7	PEC	PCEE07	Port and Harbour Engineering	3	0	0	3
.**Professional Elective Course II**							
1.	PEC	PCEE08	Earthquake Engineering	3	0	0	3
2.	PEC	PCEE09	Bridge Engineering	3	0	0	3
3.	PEC	PCEE10	Advanced Structural Analysis	3	0	0	3
4.	PEC	PCEE11	Basics of Computational Hydraulics	3	0	0	3
5.	PEC	PCEE12	Water Resources Engineering	3	0	0	3
6	PEC	PCEE13	Environmental Geotechnology	3	0	0	3
7	PEC	PCEE14	Geotechnical Design	3	0	0	3
Professional Elective Course III							
1.	PEC	PCEE15	Environmental Fluid Mechanics	3	0	0	3
2.	PEC	PCEE16	Environmental Impact Assessment	3	0	0	3
3.	PEC	PCEE17	Design of Hydraulic Structures	3	0	0	3
4.	PEC	PCEE18	Surface Hydrology	3	0	0	3
5.	PEC	PCEE19	Repairs and Rehabilitation of Structures	3	0	0	3
6	PEC	PCEE20	Urban Hydrology and Hydraulics	3	0	0	3
7	PEC	PCEE21	Building Construction Practice	3	0	0	3

S.No	Category	Course Code	Courses	Credits			
				L	T	P	TO
Professional Elective Course IV							
1.	PEC	PCEE22	Tall Structures				
2.	PEC	PCEE23	Environmental Law and Policy	3	0	0	3
3.	PEC	PCEE24	Groundwater Engineering	3	0	0	3
4.	PEC	PCEE25	Solid and Hazardous Waste Management	3	0	0	3
5.	PEC	PCEE26	Pre-stressed and Prefabricated Structures	3	0	0	3
6	PEC	PCEE27	Contracts Management	3	0	0	3
7	PEC	PCEE28	Air and Noise Pollution and Control	3	0	0	3

2.A. Master of Technology in Environmental Engineering (Full Time)

REGULATIONS – 2018

S.No	Category	Course Code	Courses	L	T	P	TO
			Credits				
SEMESTER I							
1.	Core I	YEN101	Chemistry and Microbiology for Environmental Engineers	3	0	0	3
2.	Core II	YEN102	Unit Operation and Processes in Environmental Systems	3	0	0	3
3.	Programme Elective	YEN103	Elective - I	3	0	0	3
4.	Programme Elective	YEN104	Elective – II	3	0	0	3
5.	Core Lab I	YEN105	Environmental Quality Measurements Laboratory - I (Water & Wastewater)	0	0	2	2
6.	Core Lab II	YEN106	Microbiology Laboratory	0	0	2	2
7.	MLC	YRM107	Research Methodology and IPR	2	0	0	2
8.	Audit I		Audit Course- 1	2	0	0	0
			Total	**16**	**0**	**4**	**18**
SEMESTER II							
1.	Core III	YEN201	Transport of Water and Wastewater	3	0	0	3
2.	Core IV	YEN202	Biological Treatment of Wastewater	3	0	0	3
3.	Programme Elective	YEN203	Elective - III	3	0	0	3
4.	Programme Elective	YEN204	Elective – IV	3	0	0	3
5.	Core Lab III	YEN205	Environmental Quality Measurements Laboratory - II (Air, Noise and Solidwaste)	0	0	2	2
6.	Core Lab IV	YEN206	Unit Operation Laboratory	0	0	2	2
7.	Core	YEN207	Mini Project	0	0	4	2
8.	Audit 2		Audit Course - 2	2	0	0	0
			Total	**14**	**0**	**8**	**18**

S.No	Category	Course Code	Courses	Credits			
				L	T	P	TO
SEMESTER III							
1.	Programme Elective	YEN301	Elective – V	3	0	0	3
2.	Open Elective		Open Elective	3	0	0	3
3.	Dissertation	YEN303	Dissertation Phase - I	0	0	20	10
			Total	**6**	**0**	**20**	**16**
SEMESTER IV							
1.	Dissertation	YEN303	Dissertation Phase - I	0	0	32	16
			Total	**0**	**0**	**32**	**16**

Total Credit - 68

Note

L – Lecture, T – Tutorial, P – Practical, C – Credit

PROFESSIONAL ELECTIVE COURSES

S.No	Description	Course Code	Courses	Credits			
				L	T	P	TO
Professional Elective Course I							
1.	PEC	YEN103A	Energy and Environment	3	0	0	3
2.	PEC	YEN103B	Environmental Economics	3	0	0	3
3.	PEC	YEN103C	Air Pollution and Control	3	0	0	3
.Professional Elective Course II							
1.	PEC	YEN104A	Instrumental Methods and Analysis of Environmental Pollutants	3	0	0	3
2.	PEC	YEN104B	Theory and Practice of Industrial Wastewater Treatment	3	0	0	3
3.	PEC	YEN104C	Environmental Policies and Legislation	3	0	0	3

Professional Elective Course III

1.	PEC	YEN203A	Environmental Biotechnology	3	0	0	3
2.	PEC	YEN203B	Sustainable Urban development Concepts and Strategies	3	0	0	3
3.	PEC	YEN203C	Solid and Hazardous Waste Management	3	0	0	3

Professional Elective Course IV

1.	PEC	YEN204A	Remote sensing and GIS	3	0	0	3
2.	PEC	YEN204B	Environmental Geotechnology	3	0	0	3
3.	PEC	YEN204C	Simulation and Modeling in Environmental Systems	3	0	0	3

Professional Elective Course V

1.	PEC	YEN301A	Ground Water Contamination and Transport Modeling	3	0	0	3
2.	PEC	YEN301B	Environmental Impact Assessment	3	0	0	3
3.	PEC	YEN301C	Membrane Separation for Water and Wastewater	3	0	0	3

Audit Courses

1.	AC	YEGOE1	English for Research Paper Writing	2	0	0	0
2.	AC	YPSOE1	Constitution of India	2	0	0	0

Open Electives

1.	OEC	YCOOE1	Business Analytics	3	0	0	3
2.	OEC	YMEOE1	Industrial Safety	3	0	0	3
		YMAOE1	Operations Research	3	0	0	3
		YCOOE2	Cost Management of Engineering Projects	3	0	0	3

2. B. Master of Technology in Environmental Engineering (Part-Time)

REGULATIONS – 2018

S.No	Description	Course Code	Courses	Credits			
				L	T	P	TO
			SEMESTER I				
1.	Core I	QEN101	Chemistry and Microbiology for Environmental Engineers	3	0	0	3
2.	Programme Elective	QEN102	Elective - I	3	0	0	3
3.	Core Lab I	QEN103	Microbiology Laboratory	3	0	0	3
4.	MLC	QRM104	Research Methodology and IPR	3	0	0	3
			Total	12	0	0	12
			SEMESTER II				
5.	Core II	QEN201	Unit Operation and Processes in Environmental Systems	3	0	0	3
6.	Programme Elective	QEN202	Elective – II	3	0	0	3
7.	Core Lab II	QEN203	Environmental Quality Measurements Laboratory - I (Water &Wastewater)	0	0	2	2
8.	Audit I		Audit Course- 1	2	0	0	0
			Total	8	0	2	8
			SEMESTER III				
1.	Core III	QEN301	Transport of Water and Wastewater	3	0	0	3
2.	Programme Elective	QEN302	Elective - III	3	0	0	3
3.	Core Lab III	QEN303	Environmental Quality Measurements Laboratory - II(Air, Noise and Solidwaste)	0	0	2	2
4.	Audit 2		Audit Course - 2	2	0	0	0
			Total	8	0	2	8
			SEMESTER IV				
5.	Core IV	QEN401	Biological Treatment of Wastewater	3	0	0	3
6.	Programme	QEN40	Elective – IV	3	0	0	3

	Elective	2					
7.	Core Lab IV	QEN403	Unit Operation Laboratory	0	0	2	2
8.	Core	QEN404	Mini Project	0	0	4	2
			Total	**6**	**0**	**6**	**10**

S.No	Description	Course Code	Courses	Credits			
				L	T	P	TO
			SEMESTER V				
1.	Programme Elective	QEN501	Elective – V	3	0	0	3
2.	Open Elective	QEN502	Open Elective	3	0	0	3
3.	Dissertation	QEN503	Dissertation Phase - I	0	0	20	10
			Total	**6**			
			SEMESTER VI				
1.	QEN601	Dissertation	Dissertation Phase - II	0	0	32	16
			Total	**0**	**0**	**32**	**16**

Total Credit - 68

Note

L – Lecture, T – Tutorial, P – Practical, C – Credit

PROFESSIONAL ELECTIVE COURSES

S.No	Description	Course Code	Courses	Credits			
				L	T	P	TO
Professional Elective Course I							
1.	PEC	QEN103A	Energy and Environment	3	0	0	3
2.	PEC	QEN103B	Environmental Economics	3	0	0	3
3.	PEC	QEN103C	Air Pollution and Control	3	0	0	3
.**Professional Elective Course II**							
1.	PEC	QEN202A	Instrumental Methods and Analysis of Environmental Pollutants	3	0	0	3
2.	PEC	QEN202B	Theory and Practice of Industrial Wastewater Treatment	3	0	0	3
3.	PEC	QEN202C	Environmental Policies and Legislation	3	0	0	3

Professional Elective Course III

1.	PEC	QEN302A	Environmental Biotechnology	3	0	0	3
2.	PEC	QEN302B	Sustainable Urban Development Concepts and Strategies	3	0	0	3
3.	PEC	QEN302C	Solid and Hazardous Waste Management	3	0	0	3

Professional Elective Course IV

1.	PEC	QEN402A	Remote sensing and GIS	3	0	0	3
2.	PEC	QEN402B	Environmental Geotechnology	3	0	0	3
3.	PEC	QEN402C	SimulationandModeling in Environmental Systems	3	0	0	3

Professional Elective Course V

1.	PEC	QEN501A	Ground Water Contamination and Transport Modeling	3	0	0	3
2.	PEC	QEN501B	Environmental Impact Assessment	3	0	0	3
3.	PEC	QEN501C	Membrane Separation for Water and Waste water	3	0	0	3

Open Electives

1.	OEC	QCOOE1	Business Analytics	3	0	0	3
2.	OEC	QMEOE1	Industrial Safety	3	0	0	3
3.	OEC	QMAOE1	Operations Research	3	0	0	3
4.	OEC	QCOOE2	Cost Management of Engineering Projects	3	0	0	3